PROMOTION OF RAINWATER INTEGRATION INTO, IRRIGATION, INDUSTRIAL PURPOSES, BUILDING CODE TECHNOLOGIES

TECHNICAL DESCRIPTION

Groundwater and rainwater are the main sources of fresh water in Maldives. In most of the islands, groundwater is not suitable for potable use due to saltwater intrusion and poor water quality. Future climate projections show that Maldives will experience issues with adequate availability of rain water which increases risk to accessibility and quality of water sources. Groundwater aquifers on islands lie at an average depth of 1-1.5m below the ground surface. Average, thickness of the freshwater lens is 3-5 m.

Promotion of rainwater integration into, irrigation, industrial purposes, building code technologies in the climate adaptation in water sector is based on the actions identified in the, National water and Sewerage policy, National water and sewerage act (2020) and Water and Sewerage master plan (2021-2035). The proposed technology includes combination a broad range of technologies for rainwater integration into various types of, irrigation, industrial purposes with sustainable drainage systems to use drainage infiltration techniques that supports the replenishment of groundwater resources in urban road drainage schemes. The technology also includes harvesting and storage of rainwater to use in different types of micro-irrigation technologies such as the low-head, low-cost gravity-fed drip (GFD) irrigation kits, micro sprinklers, micro tube drip system suited for smallholder farmers to highly sophisticated, capital intensive pressurized commercial micro-irrigation systems. Technologies addressed under industrial use includes waste water recovery and reuse which is widely practiced in some resorts and possibly some industrial island but not common in habited islands. Storm water recovery and reuse after filtration and treatment is also included in this category.

This technology involves integration of rainwater and desalinated water into the households distribution systems through piped network. Rain water harvesting involves harvesting rainwater run-off from designated roof areas followed by ultra-filtration and storing in storage tanks then pumping to the distribution network.

Desalination of saline water sourced from deep boreholes or ocean feed water pipe using Reverse Osmosis Technology has been used as a mean for providing a sustainable source of portable water in IWRM systems

CURRENT TECHNOLOGY READINESS LEVEL OR COMMERCIAL READINESS INDEX

Technology Readiness Levels (TRL)

TRL 9 – actual system proven in operational environment, integrated rainwater harvesting systems are installed in Many islands

Commercial Readiness Index

Level 5 - Market competition driving widespread deployment in many island at household and industrial level

CLIMATE RATIONALE OF THE TECHNOLOGY

- Ensure clean water SDG goal 6 that will improve the livelihood of the community and contribute health and wellbeing of the people and increase of economic activities
- implementing robust quality assurance against established standards to ensure water safety

- Early Detection of Contaminants: Detect pollutants, pathogens, and chemical substances early to prevent health risks.
- Environmental Protection by regularly monitoring water quality parameters.
- It provides climate change adaptation benefits in water scarce areas through water source diversification and reduced pressure on freshwater sources
- Increasing resilience to reduced per capita freshwater availability is one of the key challenges of climate change adaptation. Both short-term drought and longer-term climatic trends of decreased precipitation can lead to decreased water availability per capita.

Social

- Access to an adequate supply of freshwater for drinking, household, commercial and industrial use is essential for health, well being, and economic development (WHO, 2007), and IWRM can provide access to water for potentially water stressed or arid areas.
- Provides safe drinking water due to the high quality of output water. It can also provide water for other sectors such as industries that need very pure water sources.

Environmental

- Increasing resilience to reduce freshwater availability can overcome by harvesting and storing rainwater. Both short-term drought and longer-term climatic trends of decreased precipitation can lead to decreased water availability per capita.

AMBITION OF THE TECHNOLOGY

The overall ambition is to establish rainwater integrated water network to improve the livelihood of the community and contribute health and wellbeing of the people and increase of economic activities specifically for the water resource management where the groundwater resources are scarce and rain water storge capacity is limited. The aim of TAP is to promote a technology that is cost-effective, economically viable and environmentally friendly, low capital investment with minimum affordable production, operation and maintenance cost to the end users.

SCALE FOR IMPLEMENTATION AND TIME-LINE

The project can build on the ongoing IWRM initiatives it can be implemented in all the islands. This is the safest and adopted technology in most of the island in the Maldives financed through GCF and adaptation fund. The technology is mature and reliable

This project can be planned within a 2-3 year timeframe but the implimentation can go up to 10 years.

AMBITION FOR TECHNOLOGY READINESS LEVEL OR COMMERCIAL READINESS INDEX

Technology Readiness Level
TRL 9 – actual system proven in operational environment
Commercial Readiness Index
Level 6 - "Bankable" grade asset class

EXPECTED IMPACTS OF THE TECHNOLOGY

- Ensure water security and equitable access to safe water for island.
- Adopt cost-effective and environment-friendly, water related infrastructure Promote conservation and management of the water resources
- Protect and conserve natural water resources
- Integrated Water Resource Management (IWRM) systems

- Build flood resistant island communities
- Decentralized water security and safety plans
- Integrate stormwater management into infrastructure development projects
- increase the efficiency of water use to reduce human pressure on the existing water resources.

POLICY ACTIONS FOR TECHNOLOGY IMPLEMENTATION

EXISTING POLICIES IN RELATION TO THE TECHNOLOGY

Existing laws and policies related to water resource management includes the following:

- National water and sewerage strategic plane 2020-2025
- Baseline assessment of groundwater resources in selected islands
- Guide to groundwater improvement measures in small low-lying islands, Maldives
- Ground Water Conservation Regulation (2021/R-22)
- National water and Sewerage policy
- National water and sewerage act (2020)
- Water and Sewerage master plan 2021-2035

PROPOSED POLICIES TO ENHANCE TECHNOLOGY IMPLEMENTATION

- Establish a policy to encourage investment in rainwater harvesting systems at household level.
- Revise the national building code to include ground water rain water harvesting in real state buildings/households and ground water infiltration
- Establish a government institution for IWRM compliance monitoring, water related research, establishing and implementing water related standards, and guidelines.
- Increase awareness on maintenance of rainwater harvesting systems and good practices , social and cultural behavior change.
- Facilitate private sector involvement in water resource management collection maintance health and hygiene of rainwater harvesting systems

COSTS RELATED TO THE IMPLEMENTATION OF POLICIES

The TAP is estimated at ~USD 3,525,000, 72% funded through donor, 66% combined donor and GOM funds and 12 % from the Government budget. Estimated budget for the PI is USD 5,700,000.00 over 10 years timeframe

USEFUL INFORMATION

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LINKS TO TNA REPORTS

https://unfccc.int/ttclear/tna/guidance.html